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IVANOV ANATOLY GENNADIEVICH

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EXAMINER

BRIER, JEFFERY A

ART UNIT

PAPER NUMBER

2672

55

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

08/995,715

**Applicant(s)**GENNADIEVICH, IVANOV  
ANATOLY**Examiner**

Jeffery A Brier

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 48,50,52,55-61,63,67,69,71,73 and 75-79 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 48,50,52,55-61,63,67,69,71, 73 and 75-79 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 4/16/03 & 10/30/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/01/2004 has been entered.

### ***Response to Amendment***

2. The amendment filed on 06/01/2004 has been entered.

### ***Drawings***

3. A clean set of the drawings is requested since acceptable drawings appear across several papers. Figures 1 and 4(b) filed on 4/16/2004 are approved. Figures 5 and 6 filed on 10/30/2003 are approved. The proposed changes to figures 2, 3, and 4a filed 4/04/2003 are approved. However, formal drawings have not been submitted. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the recording embodiment claimed in claims 71, 55, 56, and 73 and the 3D holographic embodiment claimed in claims 69 and 79 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 48, 57 and 69 and the Thompson patent have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

6. Claim 61 is objected to because of the following informalities: "on y one" should be "one". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 48, 50, 52, 55, 56-61, 63, 67, 71, 73, and 75-78 are rejected under 35

U.S.C. 102(e) as being anticipated by Ezra et al., U.S. Patent No. 5,666,226. Ezra

teaches copying a 4x 4 matrix of pixels into many copies, each copy is then individually modulated to generated an image on a plane.

A detailed analysis of the claims follows.

Claim 48:

Ezra teaches an image display system comprising:

(a) at least one complementary screen (*The array of illuminators shown in figure 2 and the SLM 12 shown in figure 3 are a complementary screen.*) of one of light emitting (*The array of illuminators shown in figure 2 emit light.*) or light source modulating (*The SLM 12 shown in figure 3 modulates the light produced by light source 11.*) devices producing light in a two dimensional array of N (a real number) pixels (*Figure 1 shows a 4x4 matrix of illuminators, actually  $M_x \times M_y$ , which form picture elements on the film or diffuser plane 5.*), from which array of pixels a plurality of raster elements (*Micro-lenses on array 3 multiplies the number of pixels by the number of micro-lenses.*) are generated (*Each one of light emitting or light source modulating*

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*elements generates a raster element that will be multiplied by the micro-lenses and projected onto the film or diffuser plane 5.);*

(b) a raster multiplying system (*micro-lens array 3*) comprising a plurality of optically connected light dividing elements (*micro-lens array 3*), each said light dividing element to divide the light of the raster elements of the complementary screen into parts to form copies of the raster elements (*The raster elements generated by the array of illuminators 1 or SLM 12 is multiplied by forming copies of those raster elements onto each modulator of SLM 4.*), with said copies of said raster elements forming corresponding raster elements in P blocks (*Each modulator of SLM 4 is one of P blocks of  $M_x \times M_y$  raster element copies.*), each block ( $M_x \times M_y$  array) of said P blocks (*P corresponds to the number of elements of SLM 4.*) generally comprising a two dimensional array of said raster element copies;

(c) an array of controllable modulators located after said raster multiplying system (*SLM 4 is located after the micro-lens array.*), each modulator of said array to independently modulate (*Each pixel of the SLM modulates the light from the copied  $M_x \times M_y$  raster elements.*) the raster elements of one of said P blocks; and

(d) a surface on which said P image blocks of a total number of M pixels are formed and displayed (*Film of diffuser plane 5 is a surface which the image formed by the array of illuminators 1 and SLM 4 or SLM 12*

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*and SLM4 is projected onto. The number of pixels formed and displayed is equal to applicants claimed number M which is equal Ezra's  $M_x \times M_y \times N_x \times N_y$ . See column 2 lines 11-32 and column 3 lines 23-26.), where the number M: exceeds the number N and where said surface preceding components of (a), (b) and (e) are placed in the mentioned order of the light path of the complementary screen.*

Claim 50:

Ezra teaches a system as in claim 48, further comprising a plurality of said complementary screens (*See figure 4.*).

Claim 52:

Ezra teaches a system as in claim 48 wherein a lens raster matrix forms said raster multiplying system (*See the micro-lens array 3.*).

Claim 71:

Ezra teaches a system as in claim, 48 used for image recording (*At least column 1 lines 5 and 45, column 2 lines 37-40 and 52, and column 5 lines 29 and 41 discusses using the multiplied raster matrix for printing purposes.*) further comprising:

(e) a photosensitive plane (*Column 2 lines 37-40 discusses how the printing is performed by using a film of photographic*

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*emulsion.*) on which an outer image to be recorded is produced (*The image produced in the emulsion film is recorded since it is a non changing copy of the image. This claim does not claim any specifics of the recording.*), said outer image comprising a plurality of said blocks, each block being of a two dimensional array of pixels, and al: said blocks comprising said M pixels, where the number M exceeds the number N, and where said system components of (a), (b) and (c) are placed in the mentioned order of the light path of the complementary screen; and

(i) means to scan said outer image on said photosensitive plane into electric signals for recording (*The light that impinges upon the film 5 is an electrical signal which has been scanned onto the film for recording purposes.*).

Claim 55:

Ezra teaches a system as in claim 71 further comprising a plurality of said complementary screens (*See figure 4.*).

Claim 56:

Ezra teaches a system as in claim 71 further comprising means for optic compression of generated raster elements for increasing the brightness and pixel density of a scanning light beam (*Micro-lens array 3 and the collimating lens 2 functions as an optic compressor. At column 2 lines 61-65 Erza wrote "Light from each point of the illuminated illuminator of the array 1 is collimated by the lens 2 into a parallel beam which*



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*is focused by the micro-lenses of the array 3 through the respective pixels of the SLM 4 at the image plane 5".).*

Claim 77:

Ezra teaches a system as in claim 48 further comprising means for optic compression of complementary screen raster elements for increasing brightness and pixel density (*See the discussion of claim 56 above.*).

Claim 78:

Ezra teaches a system as in claim 48 further comprising partly transparent mirrors as said light dividing elements (*The embodiment illustrated in figure 8 uses diffraction elements 30 and 31. Diffraction elements may be considered partly transparent mirrors collimating the light from each light illuminator 1 or from each light modulator from SLM 12.*).

Claim 57:

Ezra teaches a method for forming an image on an image display surface by forming a plurality of constituent blocks of said image, so that the image is presented as comprised of a plurality of blocks (*Refer to the discussion of claim 48.*), comprising the steps of:

(a) providing at least one complementary screen having a two dimensional array of N pixels and generating from said array of pixels a plurality of raster elements (*Refer to the discussion of claim 48.*);

(b) using a raster multiplying system comprising a plurality of light dividing elements for dividing an incoming light beam of each raster element into parts, with said light dividing elements to separate a raster element corresponding light beam into a plurality of beam components to form copies of each said generated raster element in P blocks, each block generally comprising a two dimensional array of pixels (*Refer to the discussion of claim 48.*);

(c) independently modulating said beam components corresponding to the raster element copies of each of said P blocks (*Refer to the discussion of claim 48.*);

(d) repeating the procedure of generating other raster elements from said complementary screen (*Each of the pixels of the array of illuminators 1 or of SLM12 is repeatedly generated. See column 2 lines 41-44.*); and

(e) displaying the P image blocks having a total number of M pixels on an image display surface, where M is greater than N (*Refer to the discussion of claim 48.*).

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Claim 58:

Refer to the discussion of claim 50. Figure 4 shows using a plurality of complementary screens.

Claim 59:

Ezra teaches a method as in claim 57 wherein a raster element comprises more than one pixel (*At column 5 lines 25-35 Erza discusses the use of several pixels for each raster element.*).

Claim 60:

Refer to the discussion of claim 56.

Claim 61:

Ezra teaches a method as in claim 57 wherein a raster element is of the size of one pixel (*At column 5 lines 21-25 Erza discusses the use of one pixel for each raster element to enhance the resolution of the displayed image.*).

Claim 63:

Refer to the discussion of claim 52.

Claim 73:

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Ezra teaches a method as in claim 57 used for image recording (*Refer to the discussion of claim 71.*) wherein said image display surface of step (e) comprises a photosensitive plane on which an outer image is produced and further comprising that step (b) is followed by:

- (i) converting the image information received on said plane by the projection of said beam components into P electric signals (*When the light beam impinges upon the film an electric signal is generated in the film causing the photosensitive material to change state.*), one signal for one of said P blocks, for recording received information for 1' separate image elements (*Refer to the discussion of claim 41.*); and
- (g) repeating the procedure by successively generating other raster elements on said complementary screen, to simultaneously scan each of P blocks (*Refer to the discussion of claim 57 step d.*).

Claim 67:

Refer to the discussion of claim 59.

Claim 75:

Ezra teaches a method as in claim 57 further comprising the step of generating a 2 D image from said image display surface (*This claim is very broad and is met by the printing of the 2D image onto the film.*).

Claim 76:

Refer to the discussion of claim 56.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 69 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezra et al., U.S. Patent No. 5,666,226, in view of Pu et al., U.S. Patent No. 5,483,365. Ezra teaches the claimed invention except for a holograph generator for producing a 3D holographic image from said surface. Pu teaches this missing feature and gives motivation for modifying Ezra in order for Ezra's system to produce a holographic image. It would have been obvious to one of ordinary skill in the art at the time of applicants invention to use Ezras' display system to form the image formed by Pus' spatial light modulator 50 because: 1) Ezra records the displayed image on film and holographic material is a form of film; 2) Pu and Ezra both use a spatial light modulator as the display; and 3) Ezra produces a high resolution image and Pu stores a high resolution hologram image which teaches a high resolution spatial light modulator is needed.

A detailed analysis of the claims follows.

Claim 69:

Ezra does not teach 3D holographic. Ezra teaches an image display system (*Refer to the discussion of claim 48.*) comprising:

(a) at least one complementary screen of one of light emitting or light source modulating devices in a two dimensional array of  $N$  (a real number) pixels, from which array of pixels a plurality of raster elements are generated (*Refer to the discussion of claim 48.*);

(b) a raster multiplying system comprising a plurality of passive and at least partly light transmitting elements to form copies of said generated raster elements of a said at least one complementary screen, with said raster element copies forming a raster in  $P$  blocks with each block generally comprising a two dimensional array of pixels (*Refer to the discussion of claim 48.*);

(c) an array of controllable modulators located after said raster multiplying system each modulator of said array to independently modulate the raster elements of one of said  $P$  blocks (*Refer to the discussion of claim 48.*);

(d) Ezra substantially teaches a surface on which a hologram blocks of total number of  $M$  pixels are formed, where the number  $M$  exceeds number  $N$  and where said surface preceding components of (a), (b) and (c) we placed in the mentioned order of the light path of the complementary screen (*Refer to the discussion of claim 48. Ezra does not teach the hologram blocks. Pu teaches this at column 3 lines 3-9.*) ; and

(e) a holograph generator for producing a 3D holographic image from said surface (*Erza does not teach this. Pu teaches this at column 3 lines 9-15. It would have been obvious to one of ordinary skill in the art at the time of applicants invention to use Ezras' display system to form the image formed by Pus' spatial light modulator 50 because: 1) Ezra records the displayed image on film and holographic material is a form of film; 2) Pu and Ezra both use a spatial light modulator as the display; and 3) Ezra produces a high resolution image and Pu stores a high resolution hologram image which teaches a high resolution spatial light modulator is needed.* ).

Claim 79:

The combination of Ezra and Pu teaches a system as in claim 69 and Ezra teaches wherein an array of light dividing elements forms said raster multiplying system (*The micro-lens array 3 is an array of light dividing elements. See column 2 lines 61-65 where Erza wrote "Light from each point of the illuminated illuminator of the array 1 is collimated by the lens 2 into a parallel beam which is focused by the micro-lenses of the array 3 through the respective pixels of the SLM 4 at the image plane 5".* ).

**Prior Art**

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lindenblad, U.S. Patent No. 2,686,219, teaches at least one complementary screen (Kinescope 41), a raster multiplying system (light splitter and mirrors 15d and 15e), an array of controllable modulators located after said raster multiplying system (light modulators 13d, 13f, and 13e), and a surface on which said P image blocks of a total number of M pixels are formed and displayed, where the number M: exceeds the number N (the human eye is the surface that receives the image formed of pixels having more pixels than the kinescope may form at any one time.)

Konuma et al., U.S. Patent No. 5,481,320, teaches at least one complementary screen (display device 1 shown in figure 1, display device shown in figure 201), a raster multiplying system (mirrors 112 and 113 shown in figure 1, mirrors 213, 214, 215 shown in figure 5), an array of controllable modulators located after said raster multiplying system (light shutters 2, 3 and 4 shown in figure 1, light shutters 204, 205 and 206), and a surface on which said P image blocks of a total number of M pixels are formed and displayed, where the number M: exceeds the number N (column 4 lines 66-67 describes projecting the image onto a screen 116, screen 116 will receive an image formed of pixels having more pixels than the display device may form at any one time.)


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is 703-305-



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4723. The examiner can normally be reached on M-F from 6:30 to 3:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (703) 305-4713). The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jeffery A Brier  
Primary Examiner  
Art Unit 2672